creative computing software

Atari

Air Traffic Controller

(Advanced Version)

Requires 16K
Cassette CS-7004

Atari 400
or 800

This fast-moving, real time pro-
gram puts you in the chair of an air traffic
controller. You control 27 prop planes and jets
as they land, take off and fly over your air space.
You give orders to change altitude, turn, maintain a
holding pattern, approach and land at two airports.
Written by an air traffic controller, this realistic machine
language simulation includes navigational beacons and
requires planes to take off and land into the wind. With its
continuously variable skill level, you won't easily tire of this
absorbing and instructive simulation.

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We cannot guarantee that software will run in non-standard configurations, with "Foreign" peripherals, or with more or less memory than specified.

Inquiries

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AIR TRAFFIC CONTROLLER

Original and Advanced versions for Apple II, TRS-80, and Atari

Made in USA

creative computing software

AIR TRAFFIC CONTROLLER
by
David Mannering

THE SCREEN

Think of the screen as a computer-assisted radar scope. The dots are mile markers, and the distance between two adjacent ones whether vertically, horizontally, or diagonally, is one mile. The airports, navaids (navigational aids), and entry/exit fixes are depicted on the screen in their proper locations. An aircraft will appear on the screen as a capital letter. This is known as the aircraft's call sign and will always be centered on a mile marker. The single decimal digit following the call sign represents the aircraft's altitude in thousands of feet.

The instruction display area is found below the radar area in the lower left hand corner of the screen. Instructions entered from the keyboard will appear here. To the right of this area is the status display area. This area displays the game clock as well as responses to instructions and game status information. To the right of the radar area, from the top to the bottom of the screen, is the aircraft information area. This area displays aircraft speed, destination, fuel supply (in the advanced version), and other timely information.

AIRCRAFT

Speed: An aircraft is either a jet, which flies at 4 miles per minute, or a propeller craft which flies at 2 miles per minute. The radar display is updated every 15 seconds. Each jet will move one mile per update and propeller craft will move one mile every second update.

Altitude: Aircraft remain in level flight unless you instruct them to climb or descend. In level flight they are always at multiples of 1,000 feet. They climb or descend at the rate of 1,000 feet per mile. The altitude readout (the digit next to the call sign) gives an accurate indication of the aircaft's altitude up to 9,000 feet. Aircraft above 9,000 feet are extremely rare, but if one should occur the altitude will be represented as shown in the following chart:

Readout	Altitude	Readout	Altitude
:	10,000	=	13,000
;	11,000	>	14,000
<	12,000	?	15,000

Aircraft flying at 0 altitude are landing. They will accept no further altitude or heading instructions.

Heading: Aircraft may fly vertically, horizontally, or diagonally on the screen. Aircraft flying toward the top of the screen are considered to be heading north. Turn instructions are issued in multiples of 45 degrees. Aircraft will fly in a straight line unless instructed otherwise. Aircraft may turn at the rate of 45 degrees per mile except when making an instrument approach, at which time they may make a turn of up to 180 degrees over a navaid.

Active/Inactive: An inactive aircraft is one that has not yet entered or has already left your control area. The computer randomly determines at what time during the game each aircraft becomes active. You may display certain information on inactive aircraft, but you may not issue them instructions.

Fuel (in the advanced version only): Jets have enough fuel to last 15 minutes after they become active, while propeller craft have enough for 20 minutes. Active departures waiting on the ground for take-off instructions use fuel at the same rate as if they were airborne.

Arrivals/Departures: Aircraft can enter your area in one of two ways: They can fly in from one of the entry/exit fixes, or they can begin on the ground at one of the airports. Aircraft can leave your control area by flying out via an entry/exit fix, or by landing at one of the airports. Aircraft which enter through an entry/exit fix are called arrivals, and they will initially fly toward the opposite fix on the screen. This flight path will take them directly over a navaid. If the aircraft's destination is another entry/exit fix, the aircraft will continue past the navaid. This type of arrival is called an "overflight". If its destination is an airport it will hold (circle) at the navaid if you have not instucted it to do otherwise. This type of arrival is known as "inbound". Departures become active on the ground at an airport, but will not take off until you instruct them to do so. On the next appropriate update after a departure has been instructed to take-off, it will appear one mile from the departure end of the airport flying the approach heading for that airport unless you have instructed it differently. It will be at 1,000 feet climbing toward its assigned altitude.

General: Aircraft are updated in alphabetical order. When two or more aircraft occupy the same positon on the screen, the last one updated will be displayed regardless of altitude.

REQUIREMENTS

All aircraft scheduled for entry/exit fixes must exit via their proper fix. This must be the last postion occupied before they leave the screen. In the Advanced version only, when they are on the fix they must be level at 5,000 feet and heading 180 degrees from the heading that an aircraft would fly if it were entering through that fix. Failure to meet these conditions results in a boundary error.

All active aircraft must be separated by at least 3 miles or at least 1,000 feet of altitude at all times. Failure to adhere to this separation results in a conflict error. Aircraft that are climbing or descending are considered to be at both their old and new altitude for conflict purposes. Departures assigned

take-off instructions but not yet airborne are at zero altitude. Updates occur in alphabetical order and each aircraft is checked against all other aircraft. The other aircraft which are assumed to be stationary in position and altitude.

In the advanced version, an aircraft must reach its destination before it runs out of fuel.

All aircraft must reach their destinations before the game clock reaches zero (0).

A landing aircraft must be landing at its destination airport, level at zero altitude, and flying the approach heading for the airport (see approach headings). Failure to meet these conditions will cause a "go around" when the aircraft reaches an airport. A "go around" results in the aircraft climbing or descending to 1,000 feet and continuing on its last issued heading. Aircraft are assumed to be landing at the first airport encountered after an "A0" instruction (see below). This is the only error that will not end the game.

INSTRUCTIONS

To issue an instruction to a specific aircraft, first enter the aircraft's call sign (a capital letter), then enter the letter signifying the type of instruction (A for altitude, L for left turn, R for right turn), then enter a digit to indicate the magnitude of the instruction (0 to 5). Here is a chart of the aircraft instructions:

%	A	L	R
0	Descend to 0 feet Cleared to land	Hold AT Navaid	Continue Straight Ahead
1	Climb/Descend to 1,000 feet	Turn left 45 degrees	Turn right 45 degrees
2	Climb/Descend to 2,000 feet	Turn left 90 degrees	Turn right 90 degrees
3	Climb/Descend to 3,000 feet	Turn left 135 degrees	Turn right 135 degrees
4	Climb/Descent to 4,000 feet	Turn left 180 degrees	Turn right 180 degrees
5	Climb/Descent to 5,000 feet	Cleared for # Approach	Cleared for % Approach

After being given an "A" instruction, the aircraft will climb or descend at the rate of 1,000 feet per mile until reaching the assigned altitude. The top of your area is 5,000 feet, and you will be unable to climb an aircraft higher than that; however, all arrivals will enter your area above 5,000 feet and you may leave them at their intitial altitude as long as you want. When you order them to descend they cannot be stopped before reaching 5,000 feet. Most arrivals will be at 6,000 feet, but to avoid conflicts the computer assigns different altitudes to aircraft due to become active within two minutes of another at the same fix . "A0" causes the aircraft to descend to 0 altitude, but it also causes the aircraft to ignore all further instructions. It should only be issued when the aircraft is about to land.

To instruct an aircraft to take-off, you merely assign it an altitude greater than 0. It will become airborne on the next appropriate update and climb to the assigned altitude on the approach heading for the airport.

After being issued an "L1-L4" instruction the aircraft will continue straight ahead for one mile, then turn left at the rate of 45 degrees per mile until the assigned turn is completed. The "L0" instruction causes the aircraft to fly straight ahead until it encounters a navaid. Then it begins to make continuous left 45 degree turns, flying in a circle which intersects the

navaid (see diagram). This is known as holding. It will continue to hold until instructed to do otherwise. The "L5" instruction causes the aircraft to fly straight ahead until it encounters a navaid. Then it will assume the approach heading for # airport. It assumes this heading immediately, not at the rate of 45 degrees per mile.

The "R1-R4" instruction works the same as "L1-L4" except the turns are toward the right. The "R0" instruction causes the aircraft to fly straight ahead. This is useful for allowing an aircraft to fly over a navaid where it was previously assigned to hold or to stop turns before they are completed. The "R5" instruction works just like the "L5" command except the heading assumed is the approach heading for the % airport.

CLOCK

At the beginning of the game you are asked to enter a clock setting. This must be a number between 16 and 99. After entering the setting, press RETURN/ENTER and the game begins. You will be unable to enter an illegal setting, and pressing any key but RETURN/ENTER will delete your entry. The first clock advance comes in about 15 seconds. After that they are approximately one minute apart. No aircraft becomes active until the clock has advanced once. This gives you enough time to study the arrivals due in the next minute. No aircraft becomes active during the last 15 minutes of the game. This is to give you enough time to get all of the aircraft to their destinations before time runs out.

Entries made during a minute will affect clock speed. In no case may more than 16 instructions be issued between clock advances. To speed up the clock when nothing is happening, press the RETURN/ENTER key rapidly, and the clock will advance one minute per 16 keystrokes.

Since 26 aircraft become active regardless of game length, it follows that the smaller the intial clock setting, the more difficult the game. In practice, settings above 60 tend to

produce a dull game, suitable for beginners, while settings below 20 are nearly impossible to win. The random number generator is capable of producing thousands of different games at any given level.

END OF GAME:

The game ends with one of the following indicators: BOUNDARY ERROR, FUEL EXHAUSTED, CONFLICT, TIME LIMIT, TERMINATED, SUCCESS.

The first two indicators will be followed by the call sign of the aircraft involved, and its heading and destination information will be displayed so you can see what you did wrong. Conflicts with the call sign of both aircraft involved will place the conflict marks "@@" on the screen at the position that the first aircraft would have moved to cause the conflict with the second aircraft.

At the end of the game the number of aircraft (both active and inactive) that failed to reach their destinations will be displayed. The score of the game is determined this number and the initial clock setting.

In order to end a game in progress at any time after the clock has started, enter a "$"(ESC key in the Atari version). Once the game has been terminated or ended normally, you may enter a "*"(RETURN in the Atari version) to start up another game or enter a "$"(ESC key in the Atari version) to exit the program.

Maps

Advanced ATC is equipped with four radar area maps in addition to the one that is displayed when the game is first executed. Each ATC map is different and poses its own special problems. You may select one of these maps before entering a clock setting by entering an "*"(ESC key in the Atari version). Each time you press the "*/ESC" key a new map will be

displayed until you return to the original map. When you are ready to play a game on a particular map, simply enter the clock setting as you normally would.

All of the maps have two airports, 10 entry/exit fixes, and two navaids. The entry/exit fixes are arranged in opposing pairs with numbers that add up to nine, with a navaid somewhere on a straight line between them. When an aircraft enters via one of these fixes, it will be heading directly toward that navaid. When an aircraft exits through a fix, it must be heading directly away from that navaid. The approach headings for the two airports are displayed in the lower right hand corner of the screen as the map is displayed. This display disappears after the game starts.

Replaying the Same Game

Advanced ATC lets you override the random number generator and replay your last game if you choose. To do so simply enter the clock setting as normal, but instead of pressing the RETURN/ENTER key, press the "S"(ESC in the Atari version) after both digits of the clock have been entered. The game will begin. Note that you are not obligated to enter the same clock setting or even select the same map to replay the game. Thus, you can play the same game on each of the maps to see how the difficulty changes with different map configurations. If you change the clock setting, the replay, of course, cannot be exactly like the original, but the general pattern of aircraft will be the same.

Approach Headings (advanced version only)

The approach headings for the airports are displayed on the screen before the start of the game. All landings must be made on these headings and all departures will be made on these headings. You may assign a turn to a departure after it is cleared for take-off, but not before. When a "L5" or "R5" is

issued an aircraft will fly straight ahead until encountering a navaid and will then assume the approach heading for the appropriate airport. This will happen even if the first navaid it encounters is not the one from which the approach can be made.

If an aircraft is already holding, "L0" has no effect, and "L5" and "R5" will cause the appropriate heading to be assumed when the aircraft next reaches the navaid in its holding circle. All other instructions operate normally. All inbound flights have been initially assigned to hold.

Information Requests

To request information on a specific aircraft, enter the aircraft's call sign, the press RETURN/ENTER. The information will appear at the bottom of the information area on the screen, to the right of the clock, in the following format: Call sign, speed, altitude (space), initial airport or fix (arrow), destination (space), heading (space), fuel.

The speed will either be "J" for jet or "P" for prop. Altitude is in thousands of feet. Airports and fixes are as displayed on the map. If the aircraft is active, its current position, which may be a dot, will be displayed as one or two lower case letters in the advanced version and in upper case letters in the original version (n is north, ne is northeast, etc.) Fuel is displayed in minutes remaining, and will be a plus if it is 10 or more. Here is an example:
BJ6 7-> #

One minute before inbounds and overflights become active, they will appear in the aircraft information area in the above format. You will then have one minute to prepare for their arrival on the screen. Departures will appear in the information area as they become active. You may then clear them for take-off if you wish, or you can leave them on the ground. They will stay in the information area until cleared. Arrivals and overflights disappear from the information area as soon

they appear in your control area. You must then do a specific information request if you have forgotten where they were going or if you want a fuel check.

Responses

After entering an instruction or information request, press the RETURN/ENTER key. If your entry has been processed it will be acknowledged with "ROGER" in the status area. If you attempt to issue an instruction to an inactive aircraft or to an aircraft after it has been given an "A0" instruction (unless it has performed a "go around") or a turn to a ared- departure that has not been cleared for take-off, "UNABLE" will appear in the status area. No further entries will be processed until the status area is cleared. Clear the status area by pressing any key or it will clear automatically in a few seconds.

You will be unable to enter any character which is not part of an instruction or request. To delete an entry before RETURN/ENTER has been pressed, press any key that will not make a legal command.

Once you begin an entry you will have only a few seconds to complete it before the computer clears it from the instruction area. If you do not receive "ROGER" your entry was not processed.
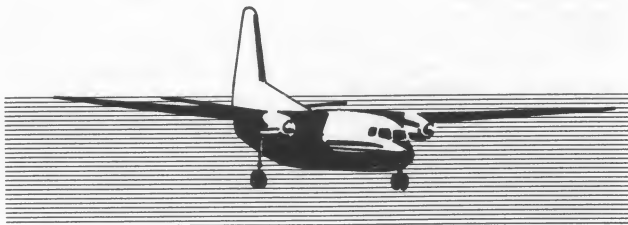
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